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09/339,199	06/24/1999	FUMIAKI NAKATAKE	21.1931/HJS	2308

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EXAMINER

RAMSEY, KENNETH J

ART UNIT PAPER NUMBER

2879

DATE MAILED: 03/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/339,199

Applicant(s)

NAKATAKE ET AL.

Examiner

Kenneth J. Ramsey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 8, 9, 11, 12, 14, 15, 17, 18, 20, 23, 24, 27-33 and 35-37 is/are rejected.
- 7) ☒ Claim(s) 5, 7, 10, 13, 16, 19, 21-23, 25, 26 and 34 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 November 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 18.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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1. The disclosure is objected to because of the following informalities: Page 21, paragraph 00109, the term "do not occur" should be --enlarge--. See the specification, page 20, paragraph 00106 to page 21, paragraph 00108. The specification, page 20, paragraph 00104, line 4 and page 21, paragraph 00109, line 1, it is not clear what is meant by "the softening point". This is said to be somewhere in the range of 420 to 440 degrees (paragraph 00110). At paragraph 00105, the applicants teach heating the same glass to a temperature of 400 to 410 degrees to "soften" the glass to a state of high viscosity so that it can be deformed. Thus true softening of the sealant begins at a point much lower than "the softening point" as defined by applicants specification. To understand this logic, the examiner views the term "softening point" to mean the least at the point at which the glass has very little viscosity, i.e. is liquid. Based upon that assumption, applicants' specification makes sense, for there is a temperature range at which the glass is neither fully solid or fully liquid, and has a high viscosity as described. Further, there is no significant point which can be readily defined as the "softening point" except the temperature point at which the glass becomes fully liquid (liquidus point) upon heating. Any other interpretation would appear to be vague and uncertain. Therefore, the examiner assumes that the applicant is referring to the liquidus point as the "softening point" because applicants' description parallels the known behavior of molten glass. If another point of reference is intended by the term "softening point", applicants are requested to show that such point of reference has clear definition and to clarify the present specification.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 23 and 30 are rejected under 35 U.S.C. 112 as failing to particularly point out and claim the subject matter which applicant regards as his invention. Applicant claims the step of "melting the sealant at a temperature below a temperature at which softening of the sealant begins". This is an oxymoron because glass starts to soften at the start of melting. Also, the purpose of melting the glass is to soften it to a point where the seal can deform and bond to the upper and lower glass substrates. See paragraph 00105 of applicants' specification. As to claim 30, since the pressure within the display panel is reduced to a lower value by exhausting via the exhaust tube 35a or by raising the pressure in the furnace, it does not appear that the recitation of claim 30 that the pressure inside the display panel is lowered with respect to the exterior of the panel by exhausting via a leak clearance between the substrates as claimed is an accurate statement.

#### Prior Art Rejections

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 27, 31-33 and 37 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by JP '3570 dated 1/14/1975 (JP 50 003,570 ). See the translation, page 6, line 3 from the bottom to page 8, line 11. As to claim 32 an inherent step of forming a

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plasma display panel is to include a discharge gas fill within the panel. As to claims 33 and 37, impurities are inherently removed in the exhausting step through the conduction pipe connected to a through hole as shown in the drawing.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 2 - 3, 8, 12, 14, 28-30, and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki et al (JP 09-251839) in view of Dynka et al (US 5,697,825) and JP '3570 (cited above). Seki discloses a process of sealing a plasma display device within a vacuum heating chamber in which the exhausting of the discharge space, removal of impurities, sealing of the periphery of a pair of plasma display panel substrates, introduction of a fill gas and closing of the fill opening are carried out in a continuous process. Seki includes a section headed "Effect" (see machine translation) that discloses the use of a pressure differential between the exterior and interior of the display panel to obtain a precise spacing (opening) between the substrates (default value) at the time of sealing the two panel substrates together. While Seki et al, embodiments 1 and 3, appear to disclose a mechanical mechanism for applying pressure, the examiner notes that the pressure is applied only to the periphery only. Thus Seki must rely upon a pressure differential to obtain the fixed distance between the substrates at the center thereof. JP '3570 confirms that it would have been obvious to rely upon a pressure differential to obtain the fixed spacing of the substrates

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in Seki. Whether the pressure differential is achieved mainly by the lowering of the pressure in the discharge space of the discharge space as in JP '3570 or by an temporary increase of furnace pressure per Seki, is a matter merely dependent upon one's view point. Both an increase of pressure in the furnace and the lowering of pressure in the discharge space have a role in the pressure differential value in Seki and there is no unobvious distinction between the two. If there were no lowering of the pressure in the discharge space while melting the sealant in Seki, there would be an inadequate pressure differential during the sealing of the substrates. The mechanical mechanism of Seki is primarily a means to increase the gap between the sealant and the upper substrate to allow a rapid evacuation of gas from the assembled display panel and is similar to the use of compressible protrusions in Dynka to initially space the pair of substrates to provide a flow path for evacuation of the substrates and removal of gases discharged from the sealant. As to claims 12 and 29, the height of the protrusions that provide a leakage path for the exhaustion of the discharge space involves a mere matter of degree with obvious results from adjustment. It would have been obvious to provide such compressible protrusions in Seki in lieu of the mechanical spacing means since they provide a cheap alternative to the mechanical spacing means. As to claims 8, 35 and 36, the use of fixing clips to initially hold the panels together prior to the melting of sealant is an well known expedient as shown by Seki, paragraph 0002 of the detailed description.

7. Claims 4 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki et al, Dynka, and JP '570 as applied to claim 1 above, and further in view of

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Murai et al (5,754,003). It is well known to form a color display panel by providing plural discharge electrodes on one substrate (20 and 12 of Murai) and providing the other substrate with fluorescent materials of a plurality of colors (column 10, lines separated by a plurality of separator walls (28 and 18 of Murai). Since a color display is desirable, it would have been obvious for one of ordinary skill in the art to provide a plurality of fluorescent materials separated by separator walls on a substrate of Seki as above modified by Dynka and JP '570.

8. Claims 6, 9, 15, 17, 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Seki et al, Dynka and JP '3570 as applied to claim 1 above or over Seki, Dynka, JP'570 and Murai as applied to claim 4, further in view of Itoh et al (6,039,620). To carry out the process of Seki, as above modified by Dynka and JP '570 or by Dynka, JP '570 and Murai, wherein the substrates form a plurality of devices which are later divided as in Itoh et al would have been obvious to one of ordinary skill since it optimizes the production process by allowing the full capability of the vacuum furnace to be used as well as to reduce the amount of possible contamination prior to the sealing of the substrates. As to claim 15, it is further noted that Itoh et al teaches joining the conduction piping to a substrate of the display panel via glass frit 8 surrounding a through hole at the same time that the peripheral seals 8 are formed to provide separate hermetic display devices. It would have been obvious for one of ordinary skill in the art to join the piping of Seki as modified above by the secondary references by the same process since it reduces the number of heating steps. As to claims 17, 18 and 20, it would have been obvious to one of ordinary skill to maintain the

differential pressure by keeping the interior of the display device at a lower pressure than the exterior thereof once the leakage path between the sealant and display substrates closes.

9. Claims 5, 7, 10, 13, 16, 19, 21-23, 25, 26 and 34 would be allowable if rewritten or amended to be made self contained and to overcome the rejection(s) under 35 U.S.C. 112, second paragraph, set forth in this Office action.

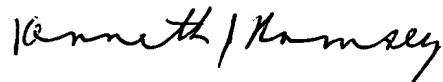
10. The following is a statement of reasons for the indication of allowable subject matter: Claims 5 and 34 are allowable since the prior art does not suggest the claimed process wherein, additionally, a barrier wall is provided to prevent an inward invasion of the melted sealant; Claims 7 and 10 are allowable since the prior art does not suggest the claimed processes thereof including connecting the evacuation tube to conduction pipes which are each located in a portion of the panel so as to be in close proximity to each other; Claim 13 is allowable since the prior art does not teach or suggest raising the pressure around the display panel at least once in the process of lowering the pressure before melting of the seal-glass layer. Claim 16 is allowable since the prior art does not teach or suggest locating the clips for pinching the plates together at inner portions of the plates so that interior portions of the plates are bowed inward relative to peripheral portions spaced apart by the height of the sealant. Claim 19 is allowable since the prior art does not teach or suggest the process of claim 15 further including exhausting the gas from the exterior of the substrates when the sealant reaches a temperature at which the degassing becomes active and ending the exhausting of the exterior of the plates when the sealant adheres to the substrates. Claims 21-23 are



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allowable since the prior art does not teach or suggest the process as claimed therein including the step of controlling the pressure on the exterior of the sealant so that a bubble does not form in the sealant. Claims 24 and 25 are allowable since the prior art does not teach or suggest the process claimed in claim 20 including the inclusion of a heater in the seal-head for exhausting the discharge space to heat and melt a part of the conduction pipe after introducing the discharge gas into the discharge space via the conduction pipe.

Any inquiry concerning this communication should be directed to Kenneth J. Ramsey at telephone number 703-308-2324.



Kenneth J. Ramsey  
Primary Examiner  
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